

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date
16 June 2005 (16.06.2005)

PCT

(10) International Publication Number
WO 2005/055126 A1

(51) International Patent Classification⁷: **G06K 9/00**

(74) Agents: DEROZA, Frank, V. et al.; Chau & Associates, LLC, 130 Woodbury Road, Woodbury, NY 11797 (US).

(21) International Application Number: PCT/US2004/039896

(22) International Filing Date: 24 November 2004 (24.11.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data: 60/525,603 26 November 2003 (26.11.2003) US

(71) Applicant (for all designated States except US): VIA-TRONIX INCORPORATED [US/US]; 25 East Loop Road, Stony Brook, NY 11790 (US).

(72) Inventor; and

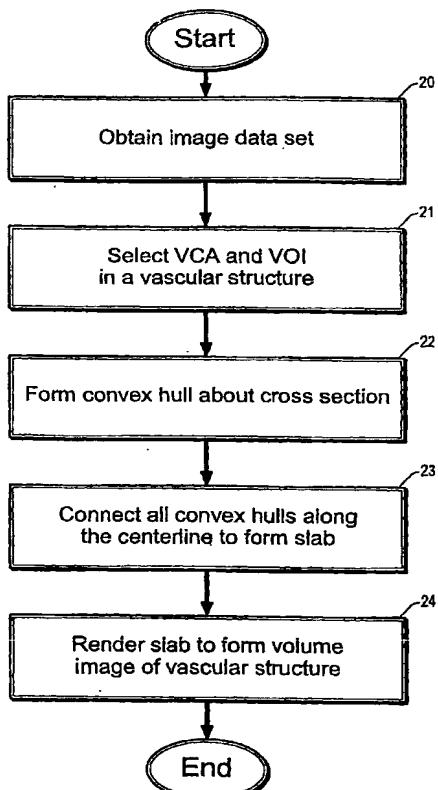
(75) Inventor/Applicant (for US only): CAI, Wenli [CN/US]; 46 Sawyer Avenue Apt. 1, Dorchester, MA 02125 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE,

[Continued on next page]

(54) Title: SYSTEM AND METHOD FOR VASCULAR VISUALIZATION USING PLANAR REFORMATION OF VASCULAR CENTRAL AXIS SURFACE WITH BICONVEX SLAB



(57) Abstract: A method for visualizing a vascular structure includes obtaining an image dataset (step 20), selecting a vascular central axis (VCA) and a vector of interest (VOI) (step 21), forming a plurality of cross sections perpendicular to the vascular central axis, forming a convex hull to enclose each cross section (step 22), wherein the convex hull is oriented by the vector of interest and determined by the shape of the cross section, and connecting each convex hull to form a biconvex slab (step 23). The biconvex slab comprises two curved surfaces that enclose a 3D volume including the vascular structure of interest. The volume within the biconvex slab can be rendered to obtain a 3D view of the entire vascular structure (step 24). Since the biconvex slab is a 3D volume, volume rendering techniques can be used to render the 3D information and generate a resulting image of the vascular structure in a flattened plane having precise 3D spatial information.



SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

- *with international search report*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*